

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

1. (currently amended) ~~Modular and software~~Software definable pre-amplifier apparatus comprising:

(a) one or a plurality of reconfigurable circuit means ~~software or firmware definable logic blocks, these logic blocks being based on programmable logic devices, which are configured in at least one of real time~~ under control of configuration data allowing said reconfigurable circuit means to implement in hardware ~~and non real time to implement in hardware~~ different signal processing functions required for at least one of different digital signal processing algorithms and different audio processing protocols, ~~thus allowing the apparatus to be used in different audio system configurations,~~;

(b) a local memory coupled to said reconfigurable circuit means, said local memory storing the ~~the programmable logic providing hardware acceleration of complex and software intensive functions, the configuration of the software definable logic blocks being performed by either configuration~~

data and being operative to supply configuration data to said reconfigurable circuit means when a different signal processing function is to be performed; and ~~stored in local memory associated with the programmable logic devices or by the host processor transferring the configuration data to the programmable logic devices directly or indirectly to local memory associated with the programmable logic devices or via a JTAG port of the programmable logic device, the choice of configuration program depending on the user selected parameters; and~~

~~(b)~~ (c) a host processor and associated program memory means for updating configuration data in said local memory and controlling[[,]] and monitoring and configuring operation of the apparatus.

2. (currently amended) ~~Modular and software~~ Software definable pre-amplifier apparatus as claimed in claim 1, further comprising integrated hard disk drive memory means or non-volatile semiconductor memory means or volatile semiconductor memory means for storing and retrieving digitized audio data signals.

3. (currently amended) ~~Modular and software~~ Software definable pre-amplifier apparatus as claimed in Claim 1, further

comprising mezzanine or card modules interfaced to said apparatus ~~to that~~ allow the apparatus to be expanded or upgraded for use with other protocols or for adding more audio output channels and or accommodating more source channel interfaces, ~~is accomplished by interfacing mezzanine or card modules to the apparatus, these said mezzanine or card modules~~ containing any combination of the following circuitry:

- 1) Digital Signal Processors,
- 2) Memory,
- 3) Programmable Logic Devices (PLDs)
- 4) Interface logic,
- 5) Analogues to Digital Converter (ADC),
- 6) Digital to Analogues Converter (DAC),
- 7) Small signal amplification and filter circuitry.

4. (currently amended) ~~Modular and software~~ Software definable pre-amplifier apparatus as claimed in Claim 1, further comprising modem means, allowing Internet access so the user can download upgrade firmware or software for implementing new audio protocols or configuring said circuit means ~~the programmable logic hardware, allowing the programmable logic and processing elements in the apparatus to be reconfigured to implement the new algorithms and or hardware configurations, the new firmware and software being stored in non-volatile memory under the control of the host processor and controller~~

circuitry, the Internet access also ~~allows~~allowing the user to download audio information, which is then processed and stored by the apparatus.

5. (currently amended) Apparatus as claimed in Claim 1, further comprising facilities to allow removable memory means containing non-volatile memory to be inserted into the apparatus and removed from the apparatus, previously stored data being read from the removable memory means and processed by the apparatus, or processed music data or digitized audio signals, formatted in a selected format, ~~are~~being stored in the non-volatile memory, allowing the user to play the recorded data on another apparatus which has the facilities to access the data stored on the removable memory means.

6. (currently amended) Apparatus as claimed in Claim 1, wherein ~~the~~said circuit means comprise software or firmware definable logic blocks that are full custom VLSI devices or Application Specific Integrated Circuits (ASICs) which implement any ~~Combination~~combination of programmable logic, fixed standard cell logic, mixed signal circuitry and processor cores.

7. (currently amended) Apparatus as claimed in Claim 1, further comprising input circuitry or output circuitry based on ~~programmable logic~~ reconfigurable circuit means, allowing interfaces to be reconfigured to implement ~~the~~ a desired interface protocol or format.

8. (previously presented) Apparatus as claimed in Claim 1, wherein the apparatus is configured for simultaneous use by more than one user where signal data from one or more signal sources is processed and output to separate peripheral units ~~one or more output circuits~~.

9. (previously presented) Apparatus as claimed in Claim 1, wherein an external modem means is employed to access the Internet.

10. (previously presented) Apparatus as claimed in Claim 1, wherein feedback signals are provided from remote microphone means to allow the signal processor devices to adapt in real time the sound of played music to desired acoustical settings.

11. (currently amended) Apparatus as claimed in Claim 1 ~~which incorporates~~ 1, further comprising analogue to digital converter (ADC) means to allow analogue input signals to be

first converted to digital signals and processed in the digital domain, the sampling frequency of the analogue to digital converter means (ADCs) being sufficient to accurately represent the signal in the digital domain.

12. (previously presented) Apparatus as claimed in Claim 1, wherein input signals to the apparatus from source means or output signals from the apparatus to signal sink means is by wireless communication means.

13. (previously presented) Apparatus as claimed in claim 12, wherein transfer of data to and from the pre-amplifier apparatus is according to Bluetooth, HomeRF, IEEE 802.11, DECT or Wireless ATM protocol.

14. (previously presented) Apparatus as claimed in Claim 3 wherein the mezzanine or card modules have interface means based on ~~programmable logic~~ reconfigurable circuit means, so that upgrades are easily implemented by changing the interface means of the associated mezzanine or card module.

15. (currently amended) Apparatus as claimed in Claim 1, wherein ~~the~~ said circuit means comprise logic blocks ~~are~~

programmed and or configured to implement reverberation and echo effects.

16. (currently amended) Apparatus as claimed in Claim 1, wherein said circuit means comprise~~the~~ logic blocks ~~are~~ programmed and configured to emulate the acoustic characteristics of a valve amplifier and alter the output signals so they sound as if they were produced by a valve amplifier.

17. (previously presented) Apparatus as claimed in Claim 1, wherein a personal computer (PC) is connected to allow control of the apparatus, reconfigure the apparatus, diagnose the apparatus or download or upload music data, which are processed or stored in internal memory for future use.

18. (previously presented) Apparatus as claimed in claim 1, wherein remote control means is used to control peripheral signal source apparatus via the pre-amplifier apparatus.

19. (previously presented) Apparatus as claimed in Claim 1, wherein digital switching means are employed to route and transfer data from the apparatus.

20. (previously presented) Apparatus as claimed in claim 19, wherein the digital switching means takes the form of a cross bar switch or a self-routing switch in which data packets or cells have an appended routing tag to control the flow of the packets or cells through the switch to their destination.

21. (previously presented) Apparatus as claimed in claim 20, wherein the digital switching means uses priority output queues to allow data with different priorities to be queued in separate queues to reduce congestion and head of line blocking.

22. (previously presented) Apparatus as claimed in Claim 19, wherein digital data for transfer via switching means is encapsulated as a variable length data packet or same length cell.

23. (previously presented) Apparatus as claimed in Claim 1, further comprising an integrated read/writable compact disc transport and associated control circuitry to allow stored digitized audio data to be read or written to compact disc media.

24. (previously presented) Apparatus as claimed in Claim 1, further comprising an integrated read/writable Digital Versatile Disc transport and associated control circuitry to allow stored digitized audio data to be read or written to Digital Versatile Disc media.

25. (previously presented) Apparatus as claimed in Claim 1, wherein peripheral units are situated remotely from the pre-amplifier apparatus in which control and data messages are transferred by wireless means allowing movement of the said remote peripheral units to different locations.

26. (previously presented) Apparatus as claimed in Claim 3, wherein the mezzanine or card modules incorporate "Plug and Play" means to allow a mezzanine or card module to configure and initialize itself and interact with the host processor to indicate the configuration, status and functionality of the mezzanine or card modules.

27. (previously presented) Apparatus as claimed in Claim 3, wherein the mezzanine or card modules incorporate means to be hot swappable, allowing card module insertion or removal from a card frame of the apparatus while the apparatus is operational.

28. (currently amended) Apparatus as claimed in Claim 1, wherein some of the ~~logic devices are~~ reconfigurable circuit means are configured to implement functions and algorithms normally performed in ~~"conventional"~~ peripheral equipment, allowing new peripheral equipment which operates with said modular and software definable pre-amplifier apparatus to have reduced functionality.

29. (previously presented) Apparatus as claimed in Claim 1, wherein the apparatus is programmed to record data using "non-volatile" memory means at a predefined time from a peripheral device.

30. (canceled)

31. (currently amended) Apparatus as claimed in claim 1, wherein said ~~software definable logic blocks~~ circuit means include digital signal processor devices and associated memory devices, the configuration and allocation of the software programs used by each digital signal processor device being performed in real time ~~or non-real-time~~ by the host processor or configuration routines stored in non-volatile memory associated with the digital signal processor devices, the

Appln. No. 09/888,572

Amd. dated April 12, 2005

Reply to Office Action of January 13, 2005

allocation of the specific software program being determined
by user inputs.

32. (new) The apparatus of claim 1, wherein said apparatus is
modular.